UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

Office of Chemical Safety and Pollution Prevention

MEMORANDUM

OPP OFFICIAL RECORD
HEALTH EFFECTS DIVISION
SCIENTIFIC DATA REVIEWS
EPA SERIES 361

Date: March 31, 2011

Subject: **Sodium Cyanide and Hydrogen Cyanide**: Storage Stability Data for Citrus Following Post-Harvest Hydrogen Cyanide Fumigation.

PC Code: 074002 & 045801
Decision No.: not applicable
Petition No.: not applicable
Risk Assessment Type: not applicable
TXR No.: not applicable
MRID No.: 47428102

DP Barcode: 353738
Registration No.: not applicable
Regulatory Action: not applicable
Case No.: 3086
CAS No.: 143-33-9
40 CFR: 180.130

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Storage stability data for citrus were required by the Sodium Cyanide Registration Eligibility Document.

EXECUTIVE SUMMARY:

After fumigation with sodium cyanide at a rate of 1 oz NaCN/100 ft^3, hydrogen cyanide residues in/on whole citrus, citrus peel, and citrus pulp were analyzed following Microbac Laboratories Standard Operating Procedure for EPA Method 335.2 modified for analysis of citrus at increments of 16, 25, 27, 31, 34, 41, 52, and 64 days. The registrant is intending these data to represent storage stability data. However, no samples were analyzed at the time of sampling (time zero). Therefore, initial concentration of hydrogen cyanide is unknown. Storage stability data are required for citrus demonstrating stability of hydrogen cyanide for up to 2 months prior to analysis. However, these data can be used in refining the dietary exposure analysis.

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INTRODUCTION/BACKGROUND:

Washburn & Sons, Inc. has submitted data for storage stability of hydrogen cyanide (HCN) residues in/on citrus after fumigation with sodium cyanide (NaCN).

DISCUSSION:

Washburn & Sons, Inc. has submitted data for storage stability of hydrogen cyanide residues in/on citrus after fumigation with sodium cyanide. (2008; MRID 47428102) titled:

Storage Stability Data for Citrus Following Postharvest Hydrogen Cyanide Fumigation: Whole Fruit, Peel, Pulp.
Author: Robert Krieger, Ph.D.
Performing Laboratory: Personal Chemical Exposure Program, University of California, Riverside, CA
Project ID: UCR Study Number: HCN/2-08
Final Report Date: March 5, 2008.

Citrus transport trailers were fumigated at a rate of 1 oz NaCN per 100 ft^3 of trailer volume. Oranges and lemons were fumigated at Washburn & Sons, Inc. in Highgrove, CA which is the only operator of a trailer/truck citrus hydrogen cyanide fumigation facility for the protection of citrus against surface insects in California. The trailers were fumigated in a closed system containing NaCN by addition of sulfuric acid to water at a rate of 1 oz NaCN/100 ft^3. After one hour of fumigation the trailers were exhausted for approximately 30 minutes.

Oranges were sampled before fumigation to be used as control samples. Fumigated samples were sampled at the end of ventilation. Samples were processed as whole fruit, peel, and pulp by University of California at Riverside personnel. The samples were frozen and shipped to Microbac Laboratories, Inc. in Corona. Samples were analyzed for hydrogen cyanide residues following Microbac Laboratories Standard Operating Procedure for EPA Method 335.2 modified for analysis of citrus At increments of 16, 25, 27, 31, 34, 41, 52, and 64 days, Microbac Laboratories personnel removed samples from frozen storage and analyzed for hydrogen cyanide residues. These increments of sampling were chosen by University of California at Riverside personnel. The registrant is intending these data to represent storage stability data. However, no samples were analyzed at the time of sampling (time zero). Therefore, initial concentration of hydrogen cyanide is unknown.

A summary of HCN residues in/on whole citrus, citrus peel, and edible pulp are listed in Table 1.

Table 1. Summary of HCN residues in/on whole citrus, citrus peel, and edible pulp.

Commodity	Days After Sampling	Concentration (ppm)
Whole Orange	16	1.2
	27	0.72
	27	0.49
	34	0.91
Whole Orange	25	1.62
	25	1.81
	41	2.13
	64	1.30
Whole Orange	16	2.01
	31	1.20
	31	1.11
	52	3.73
Whole Orange	25	3.14
	34	1.89
	34	2.37
	52	1.86
Whole Lemon	16	0.90
	31	0.68
	41	1.10
	64	0.51
Orange Peel	31	2.87
	31	3.15
	41	3.22
	52	2.64
Orange Peel	27	4.82
	31	2.34
	41	3.52
Orange Peel	27	2.76
	41	3.45
	52	0.64
	64	3.65
Orange Peel	25	8.00
	27	4.15
	34	7.65
	34	5.06
Lemon Peel	16	4.09
	16	2.98
	34	2.75
	52	2.41
Orange Pulp	25	0.05
	31	<0.04
	64	0.04
	64	0.04
Orange Pulp	16	0.30
	25	0.04
	31	0.36
	41	0.33
Orange Pulp	16	0.14
	41	0.10
	41	0.07
	64	0.07

Orange Pulp	25	0.14
	34	0.20
	41	0.07
	52	0.13
Lemon Pulp	25	0.08
	31	0.15
	41	0.04
	52	<0.04

CONCLUSION:

After fumigation with sodium cyanide at a rate of 1 oz NaCN/100 ft^3, hydrogen cyanide residues in/on whole citrus, citrus peel, and citrus pulp were analyzed following Microbac Laboratories Standard Operating Procedure for EPA Method 335.2 modified for analysis of citrus at increments of 16, 25, 27, 31, 34, 41, 52, and 64 days. The registrant is intending these data to represent storage stability data. However, no samples were analyzed at the time of sampling (time zero). Therefore, initial concentration of hydrogen cyanide is unknown. Storage stability data are required for citrus demonstrating stability of hydrogen cyanide for up to 2 months prior to analysis.

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RDI: SVH:3/31/11

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